

# INTEGUMENTARY SYSTEM

Revised 13 Sept 2016

Fr. S&M p. 93, Martini 7<sup>th</sup>, pp154-177, 7<sup>th</sup>: 158-181, 9<sup>th</sup>: 145-168, 10<sup>th</sup>: 151-173

in- tegere (to cover) simple organ (epithelial and CT): includes skin & accessory structures

## THREE MAIN LAYERS: (p 151)

- epidermis** stratified squamous epithelium (closely packed epithelial cells)
- dermis** dense, irregular connective tissue. (corium [leather])
- hypodermis** Loose aerolar: subcutaneous (superficial fascia) often adipose, connects dermis to underlying fascia of muscles or periosteum (of shin etc.)

## EPIDERMIS: four layers, bottom to top: (p 154)

- 1 **Stratum Germinativum: Stratum Basale:** mitosis: columnar at bsmnt memb  
**Stratum Spinosum:** 8-10 layers thick, projections to adjacent cells (some mitosis here)
- 2 **Stratum Granulosum:** 3-5 layers thick, granules of **keratohyalin** increase to outer cells, cells thereby dying
- 3 **Stratum Lucidum:** Contain eleidin [olive oil] droplets converted to **keratin**
- 4 **Stratum Corneum:** 15-30 layers thick (cornu: horn) **keratinized** cells

**Keratin** [horn agent] invented by reptiles, protects fr invasion, water loss, digestion

No vessels in epidermis, dermis carries vessels and nerves.

**Melanocytes** give color, transfer melanin to stratum germinativum (p 158) ¶|ABCDs of **melanoma:**

Blushing, cyanosis caused by dilation or constriction of dermal capillary system

## DERMIS: dense irregular connective tissue, develop from mesoderm.

contains **collagenous, elastic, and reticular** fibers.

Two indistinct layers: **Papillary layer:** [nipple little] fits close to epidermis, forms fingerprints

**Reticular layer:** collagenous fiber bundles, (See **lines of cleavage**, p 161) continuous with **hypodermis:**

## HYPODERMIS (superficial fascia): loose, aerolar connective tissue, often with fat cells

## HAIR (p 164) Consists of column of keratinized cells

**Follicle** [nest little] inner layer of stratum germinativum, outer layer of connective tissue fr dermis

**Papilla, matrix** formed from dermis at base of follicle contains capillaries, mitosis in matrix

**medulla** (loose), **cortex** (tightly compressed), **cuticle** very hard grows fr epidermal cells, at bottom of hair follicle

**arrector pili** smooth muscle causes to stand up, forms goose pimples

## NAIL: (p 169) Nail bed formed by germinativum.

**matrix** Root, forms the nail, heavily cornified, mostly buried, nail formed fr two outer layers corneum and lucidum

**eponychium** [upon claw] "cuticle", fold of dead skin protects proximal end of nail

**lunula** [moon little] due to thickened distal matrix obscuring vessels underneath

**hyponychium** "quick" the place you stick splinters...

## GLANDS: two types: sweat and sebaceous. Also ceruminous ciliary (eye lids); mammary (p 168)

### Sebaceous Glands: (p 166) **holocrine**, Sebum oil secreted onto hair shaft keeps fr drying.

Also contains antibacterial organic acids. Production stimulated by sex hormones esp testosterone.

Generally alveolar (= acinar) (sacs) **holocrine** glands

### Sweat: (p 167) merocrine gland (secretions do not accumulate) simple tubule, stimulated by sympathetic NS.

secretions contain NaCl, urea, sulfate, phosphates.

**apocrine**, secrete part of cell with thicker and more complex sweat. large glands of axilla, anus, scrotum & labia major

## FUNCTIONS of skin:

Protection: water loss, UV, microorganisms: organic acids make acidic

Temp regulation: Hot?: dilation of capillaries, sweat. Cold?: vice versa

Excretion: Urea and NaCl. Comp'n varies according to needs of body

Sensation: temp, touch, pressure, pain.

Vitamin D formation: 7 dehydrocholesterol + UV makes calciferol

## PATHOLOGIES:

Acne puberty provokes xs sebum, *Corynebacterium acnes* infects

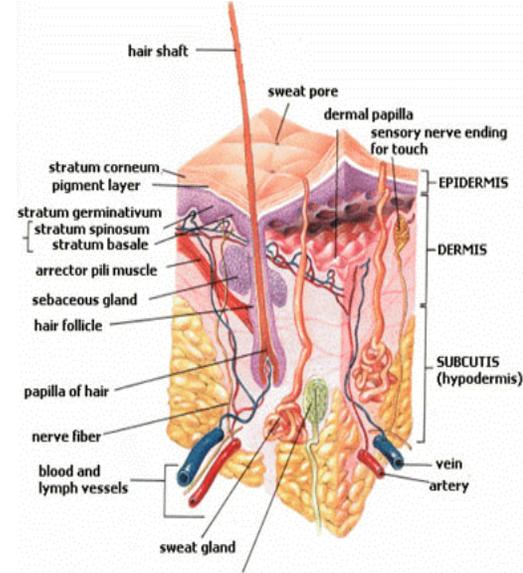
Warts viral, can be found in groups, plantar warts on sole of foot

Dermatitis inflammation of the dermis = degranulation of mast cells (PI, etc)

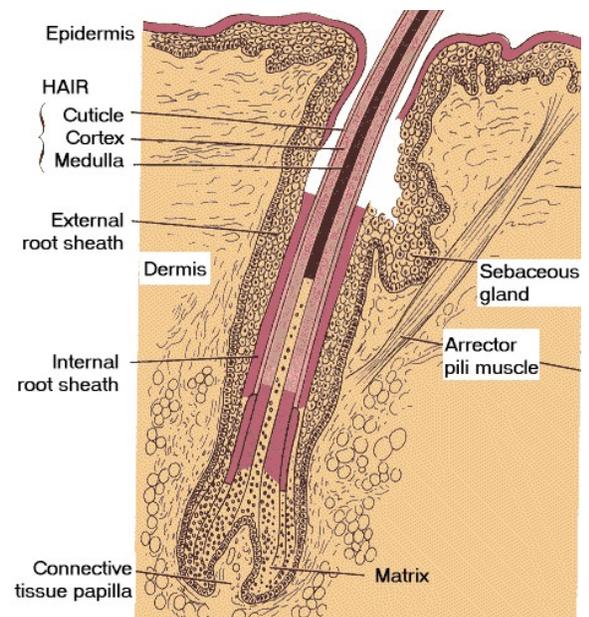
Psoriasis red brown elevations, silvery scales form on surface.

Impetigo combined infection of staph and strep

Moles congenital, usually benign. May incr. in size pigmt, redden, itching



Asymmetry 1/2 dif fr 1/2  
Border irregular  
Color uneven  
Diameter >6 mm



**BURNS:** (171) **RULE OF NINES for burns:** head 9, upper limb 9, trunk frnt 18, genitalia 1, lower limb 18 each.

**HEALING PROCESS OF SKIN:**

- 1) **Inflammatory phase**, mast cells: histamine, clot formation
- 2) **Migratory phase:** fibroblasts and macrophages move into clot, make fibers and clean up  
Basal cells migrate into edge of wound
- 3) **Proliferation phase:** epidermal cells move over fiber meshwork
- 4) **Scarring phase:** scab shed, scar tissue causes depression in wound.